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We sustain as much loss of life and health in prosecuting missionary work in London, as those societies do the object of which is to send missionaries to foreign parts, many of which are notoriously unhealthy. This is a reproach to the metropolis of our country. There are some districts respecting which we almost feel sometimes a question whether we ought to expose the health and life of men by placing them on them; and there are other districts on which missionary after missionary has broke down, when located there; while even in a large number of our districts, the energy, strength, and vigour of our missionaries become impaired by their constant exposure to impure air.

The widowhood and orphanage from pestilence, inasmuch as there is always a large proportion of married adults attacked, are immeasurably greater in proportion to the gross number killed than in war. In 1842, on an enumeration, it appeared that there were 27,000 cases of premature widowhood, and upwards of 100,000 orphans then chargeable to the poor rates, from preventible causes. In the returns from 12 Unions, where there had been 11,170 deaths from cholera, it was found that there were 3,567 widows and orphans chargeable to the epidemic cholera of 1848-49; and an expenditure, for only four years' relief, of £121,000. In the same proportion for the whole of the 72,000 deaths, the total number of widows of the class falling into destitution would be 23,000, and the four years' charge of them £780,000.

The total expense of funerals is estimated at £500,000, and the total private as well as public expenses of that one epidemic at not less than two millions, notwithstanding extensive checks and mitigations.

Taking as the test of the obtainable rate of mortality the rate obtained in good old dwellings improved by self cleansing drainage works, as well as by improved supplies of water—as well as in the new model dwellings (namely, 13 in 1000, the common average of the whole kingdom being 23 in 1000)—the total annual losses from preventible disease, from lost labour by premature death, and excessive and premature sickness, and the expense of excessive numbers of funerals, is under-estimated at 12 millions per annum, or about the total annual charge of the entire army and navy.

## REVIEWS OF NEW WORKS.

### *Twelfth Annual Report of the Registrar General of Births, Deaths, and Marriages, in England.*

THE Reports made to the Government from time to time by the above-named officer, contain, as is well known, matter of the highest public interest and importance, and would be invaluable for many purposes, were they unaccompanied with any extraneous information. But they are rendered of still greater value by the letters appended to them from Mr. Farr, whose labours as a statistician and, as we believe we may say, an amateur actuary, are now familiar to the public. The present Report has one of these letters, touching upon almost every question connected with the rates of mortality, sickness, and interest of money—the calculations founded upon them—the constitution and management of Assurance Societies—the adaptation of life and health assurance to the wants of the poorer classes—the nature of deposit assurance—and, in short, the whole subject, briefly, it is true, but in its widest comprehensiveness.

The letter commences with observations on life tables, and a comparison of the principal ones with those formed by Mr. Farr. The defects of the Northampton Table are pointed out; and in reference to them Mr. Farr says—

"Great injustice has been done by the use of this Northampton Table ; which, in mutual Offices, makes one member pay 40, 30, 25, 20, 10 per cent. more than the premium which is required to secure a policy of the same value, and distributes the surplus thus acquired unequally. The old Offices, which have used the Northampton Table, have a great difficulty in setting themselves right. By its use the proprietary Offices have exacted enormous and unequal premiums from the portions of the community who happened to be ill versed and ill instructed in the intricate science of life insurance.

"A false life table can be defended by the same arguments as a depreciated currency; and the substitution of a correct table causes the same kind of disturbance in the value of the shares of members as a recoinage of clipped money, or a return from a depreciated paper to a metallic currency, introduces into the value of commodities and securities. The Northampton Table has still silent adherents, but few open defenders; and some of the old Offices have, greatly to their credit, since the error in that table has been placed beyond doubt, abandoned its use."

The discussion of the merits and defects of these life tables leads to observations on the rates of premium charged, and to comments on their great variety.

Speaking of Life Insurance Offices, the author says—

"A Life Insurance Office is a bank, in which deposits are made every year, to be withdrawn at the death of the depositor; it is a lottery reversed, as for unequal sums it sells equal prizes; it is a trading firm, in some cases seeking partners every year, and always seeking customers; it is a company of capitalists constantly looking out for long investments, and well organized, to deal profitably in securities at some greater risk than those returning 3 per cent. interest.

"The commercial balance-sheet, in the most correct form, fails to present a correct view of the condition of a Life Office transacting ordinary business, as its liabilities are distant, contingent, and every year varying in value."

He proposes to use the term 'insurer' for the party granting the "insurance," and 'insuree' for the one whose life is concerned.

"The *insuree* performs two functions; which are separated where a third party (*insurant*) procures the policy, and pays the premiums. Under one aspect the same person is the *insuree*, under another he is the *insurant*."

The three kinds of Offices are described, and the writer then comes to the important question of the "determination of the financial condition of Life Offices." He describes the old method of valuation, as practised with the Northampton Table, and continues—

"Under this mode of valuation, as the premium is assumed to be net, no allowance is made for expenses of management, or for any contingencies which are left uncovered by the life table. By the Northampton Table, which Mr. Morgan used, the value of the sums insured is overstated, and the value of the future premiums is understated; so the stock which is required to meet the future contingencies comes out, by a similar calculation, at £3,817,530. For the premium has by that table a latent charge, irregularly laid on, and its errors, in the particular case, are on what has been called the safe side.

"This method of valuation, which is sanctioned by the books on insurance, is defective, as it leaves out of account the charge on the premium, and the purposes to which that charge is destined. An Office that had expended nearly the whole of its premiums, and had no stock, or very little, advertised a profit of some such sum as £96,000, which was probably the capitalized value of *the charge* on the future premiums. This paradoxical result flows directly from the principle of valuation which the books sanction."

Again:

"It is urged by one class of actuaries that the *charge* should not be brought into account; and what I have said hitherto is in accordance with this view. Other actuaries take the opposite view.

"The object of these investigations is twofold:—

"To determine the financial condition of the Society at a given date, and to learn to what extent its liabilities or its assets are in excess;

"To show what portion of any existing surplus in the assets is fairly available and disposable as realized profit.

"It is evident, in the first instance, that in a Society of any extent all the chances of mortality are, or should be, provided for by the life table; and that all the risk of investments is covered by taking the rate of interest so low as 3 per cent. Therefore, after deducting the cost of management from the charge on the premium, the rest of that charge may be fairly viewed as a probable surplus, as it is indeed assumed to be in fixing the rates of premiums either of a mutual or of a proprietary Life Office. To recur to the Equitable valuation, some of the Offices realize, on an average, 4 per cent. interest on all their investments; if the Equitable count on this rate of interest, it would require £2,959,597, with the future premiums—for which it has the absolute security of its creditors—to enable it to pay off its policies as they fall due. The assumption that its investments will only return an interest of 3 per cent. makes its required capital, by the English Table, £3,479,275, or half a million more than the sum which may possibly be sufficient. The cost of carrying on this great Office is apparently about £10,000 a year; the present value of which, at 11·7 years purchase (the average value of the premiums), is £117,000, to be deducted from the aggregate value of the premiums; as, without some such expenditure, the Society cannot be sustained, the profits on the premiums cannot be realized. If the Equitable Society had securities worth £3,596,275 to meet the policies in force at the time of this valuation, no one, I conceive, could question its solvency.

"That this is the correct mode of proceeding in an investigation to determine the solvency of an Office insuring lives by invariable premiums, cannot be disputed. The charge on the net premium must be taken into account; otherwise, as Mr. Jellicoe forcibly remarks, "a Society charging very low premiums would show, *cæteris paribus*, the same assets as another charging very high ones, supposing both to value by the same table."

Here we must for the present pause, hoping shortly to resume the examination of this able and elaborate treatise.